APPENDIX E

DESERT CONCEALMENT AND CAMOUFLAGE

In the desert, camouflage problems are encountered that require imagination, ingenuity, and intelligence. The lack of natural overhead cover, the increased range of vision, and the bright tones of the desert terrain place emphasis upon siting, dispersion discipline, and the skillful employment of decoys to achieve deception and surprise. Total concealment is rarely achieved, yet proper camouflage measures can reduce the effectiveness of enemy observation, and consequently enemy operations.

Cover from enemy direct fire may be afforded by dunes, hills, and other irregularities in the desert terrain. Camouflage is an essential part of all operations in the desert and the importance of the concept must be impressed upon fresh units and individual replacements upon their arrival in theater. Poor camouflage may also compromise a high-level plan and lead to an operational failure. One poorly concealed vehicle can compromise an entire task force. Improvisation of available assets is just as important as being able to properly use camouflage systems. As previously described, deserts generally do not offer much natural concealment or means for camouflage; therefore, make maximum use of any artificial means available.

VEHICLES AND AIRCRAFT

Movement of vehicles produces dust, diesel plumes, and distinctive track marks. The slower the speed, the less dust that is produced; however, the need for speed must be balanced against the amount of dust that may be produced. Drivers must avoid harsh use of accelerators, the main cause of diesel plumes.

Shine from optical instruments (which should be kept shaded), and matte paint that has been polished by continual wear, or from tracks, particularly if rubber blocks have been removed, are difficult to camouflage during the desert day. See Figure E-1 for shading optics. Running gear on tracks that has been polished by wear should be covered with burlap when stationary. Windscreens and windows should be removed or lowered to prevent reflection of the sun and heat. Vehicle silhouettes can be reduced in the forward areas by removing cabs and tops.

Disruptive pattern painting for vehicles and aircraft is described in FM 20-3. Local materials can also be used. The color and texture of the local terrain is best represented by placing dirt on vehicles and using a little water to make it stick.

The effects are increased by covering a vehicle with a wide-mesh net and using foliage brackets to attach local vegetation. Twine or wire may be used as an alternative to the mesh net, provided vegetation is available.

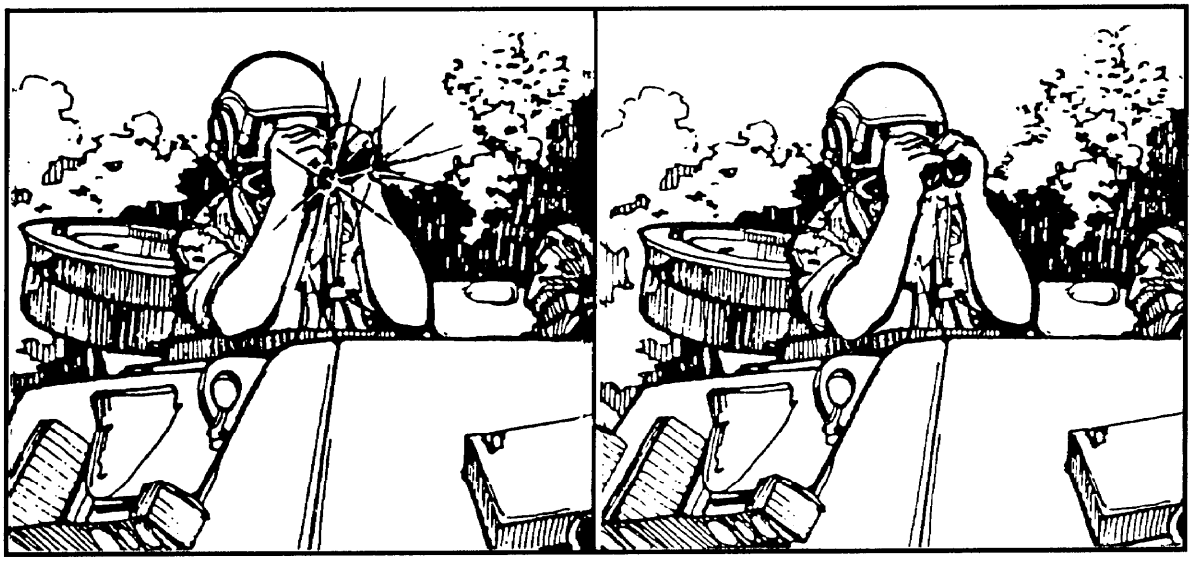

Figure E-1. Shade optics to prevent shine.

Some or all of the equipment listed in the following paragraphs should be available for every vehicle and aircraft, although aircraft will not necessarily be able to carry all of it.

The preferred net is the lightweight camouflage screen system (LCSS), desert version, which provides concealment against visual, near IR, and radar target acquisition/surveillance sensor devices. Additional y, the transparent version of the LCSS allows US units to camouflage radars (less CW type radars) without degrading operations. A desert camouflage net should be a complete cover, as it depends on its Imitation of the ground surface, and both color and texture, for its effect. The alternatives to the LCSS in order of priority include the following:

- The specially produced desert-pattern net of the lightweight screen system.
- An open-weave cloth (colored as appropriate to the soil or "patched) stitched to an ordinary wide-mesh net and used with the string uppermost. This provides both color and texture and can be suitably garnished with radar-scattering plastic, such as that used in the lightweight screening system, and with any local vegetation.
- A cover of close-weave cloth, colored as appropriate.
- A standard net garnished solid, threaded in long straight strips that have been colored to harmonize with the terrain. The garnishing must be maintained.

The number of nets issued depends on the size of the equipment to be covered, but should be sufficient to allow a gradual slope of not more than 15 degrees from the top of the equipment to the earth. Each company-size unit should be equipped with a spray gun and various tints of paint to provide for temporary variations in net color to match the terrain.

When using nets for stationary equipment—

- Do not allow nets to touch sensitive items such as helicopter rotor heads and radio antennas which may cause a net to catch fire.
- Do not pull nets so tight that each supporting pole stands out.
- Ensure the net does not prevent the equipment from fulfilling its primary task. In some equipment, such as helicopters, a net must be easily removable to reduce reaction time.
- Avoid straight-edged patterns on the ground, which indicate something is there.
- Use burlap spray-painted in a nondescript desert color to cover all reflecting surfaces (excluding fire control optics) and shadow-producing areas under vehicle bodies, including tank suspensions. Aircraft equipped with windscreen covers will not require it.
- Cut desert scrub in the immediate area.
- Use poles, natural or man-made, to raise the nets from the equipment, thereby hiding its shape. They must be brought into the area of operations by the force and are extremely difficult to replace in the desert if lost or damaged.
- Make a “mushroom” out of thin iron tubing locally, It resembles an open umbrella without its cloth cover and with the end of the spokes joined together. Slotted into a socket that has been welded onto the top of a tank, self-propelled gun, or personnel carrier, it lifts the net above the vehicle, concealing its shape, increasing air circulation, and permitting the crew or team to use the top hatches.
- Hook and hold a camouflage net to the ground away from the vehicle by using wooden pegs or long steel pins, depending on soil consistency.
- Use mallets to drive pegs and pins into the ground.

After dismounting local security, camouflage is the first priority when a vehicle halts. Actions to be taken are-

- Site in vegetation or shadow, if available.
- Cover shiny surfaces and shadow areas with burlap screens.
- Drape the net.
- Add any available vegetation to the net.
- Blot out vehicle tracks for 50 meters behind vehicles.

Stationary aircraft take a relatively long time to conceal as they are fragile in comparison with other equipment, have a considerable heat signature, and must also be readily accessible for maintenance. The more they are concealed, the greater their response time is likely to be. Tactical flying is discussed in Appendix B, but take the following actions in sequence when approaching a landing site where aircraft will stay for some time:

- Ensure aircraft approach the site terrain-masked from enemy surveillance.
- Close down aircraft as soon as possible.
- Cover all reflective surfaces.
- Move aircraft into shadow if it can be towed or pushed.
- Shift the main rotor (depending on the type) until it is at a 45-degree angle with the fuselage and drape a net over the rotor and fuselage. The rotor must be picketed to the ground.
- Conceal the remainder of the aircraft.

POSITION SELECTION

Position selection is critical at all levels. One of the fundamentals of camouflage in any environment, but particularly the desert, is to fit into the existing ground pattern with a minimum of change to the terrain. A wadi bottom with vegetation or a pile of boulders that can be improved with grey burlap and chickenwire are good examples. Sites chosen must not be so obvious that they are virtually automatic targets for enemy suppressive frees, and antennas must be screened against the enemy, if possible.

Shadows, particularly in the morning and evening, identify objects; so equipment must be placed in total shadow (rarely found), or with its maximum vertical area facing the sun so that minimum shadow falls on the ground ("maximum vertical area" is the rear of a 5-ton truck with canopy, but the front of an M88, for example). See Figure E-2 for the effects of shadows. The shadow can be broken up, which is normally achieved by siting equipment next to scrub or broken surfaces, such as rocks. Equipment should not be sited broadside to the sun, and it is usually necessary to move as the sun moves. Digging in reduces the length of any shadow that is cast (on the principle that the lower the object, the shorter the shadow).

Vehicles passing over pebbles or heavy ground surfaces press the pebbles or gravel into the soil, causing track marks to be prominent when viewed from the air. Avoid such areas if possible. Use existing trails and blend new trails into old ones whenever possible.

Soil texture suitable for digging must be a consideration when reconnoitering for battle positions. Holes must be covered to avoid shadows being cast. If vehicles will be in position for more than a day, trenches should be dug for them.

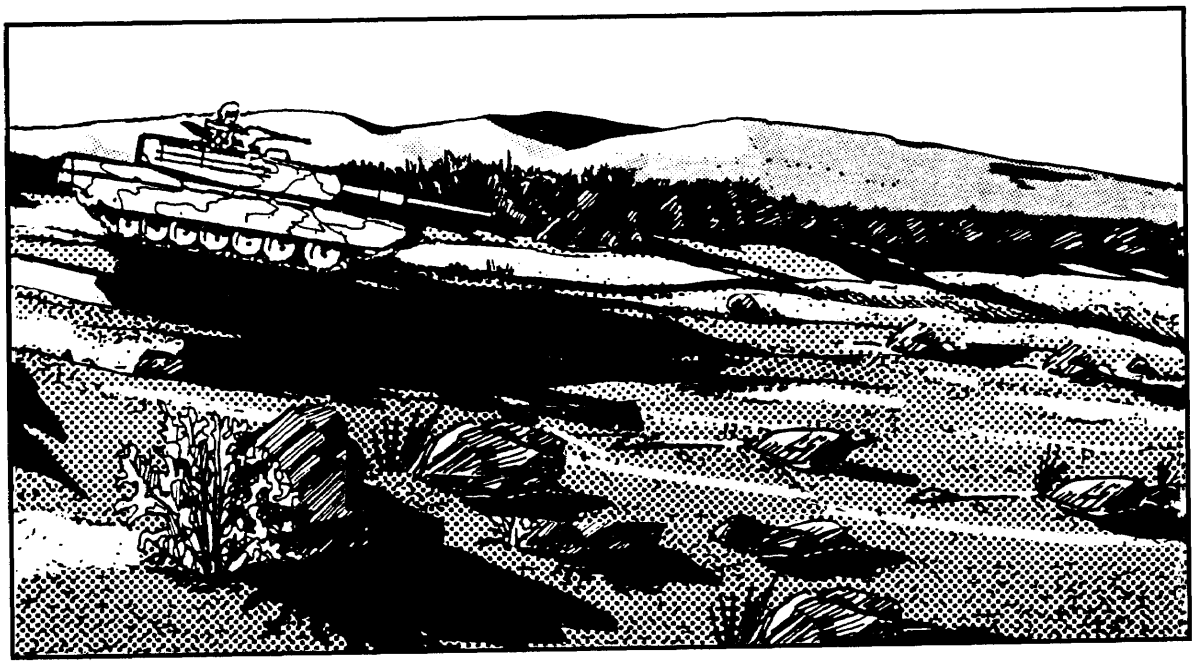

Figure E-2. Camouflage: the effects of shadows.

In forward areas, tactical operations centers are probably the most difficult positions to hide although their need for concealment is great. They require strict camouflage discipline. Vehicles and aircraft should not be allowed to approach closer than 300-400 meters. They must be dispersed and concealed so nets may have to be readily available for aircraft. Pay special attention to lights and noise at night.

Generators will have to be dug-in and allowed adequate air space for cooling. Radios and antenna systems must be remoted as far out as possible, and in different directions. Whenever possible, dig in the entire command post. Use engineer assets to build a berm around the perimeter and to help break up the silhouette and to enhance security. Other equipment should not be placed too close to minimize the possibility of the enemy's attention being attracted to the site.

Engineer activity often precedes operations, which makes it important that such work be concealed from enemy surveillance. The following guidelines should be used to conceal engineer activity:

- Employ the minimum number of equipment and personnel.
- Keep equipment well away from the site, and dispersed and concealed if not in use.
- Complete all possible preparations well away from the site.
- Follow the ground pattern, if possible.

Combat service and support assets must rely on concealment for most of their protection. The following guidelines will assist unit commanders in concealing trains while stationary or on the move:

- All vehicles of a given type should look alike. This will make it difficult for an enemy to pick out critical vehicles, such as water and fuel trucks, in a column. Canopies over fuel trucks disguise them and prevent radiant heat from striking the fuel containers.
- Vehicles should follow the tracks of the preceding vehicle if it is possible to do so without breaking through the crust, as this reduces the possibility of an enemy intelligence analyst to calculate how many vehicles have passed.
- Screen exhaust systems to reduce heat signature.
- Vehicles must never form a pattern, either when stationary or on the move.

SUPPLY POINTS

A supply point is likely to be in a location where its main threat of detection will be either by the eye or by photograph. Normally, greater emphasis can be placed on selecting supply positions from the point of view of concealment rather than for tactical efficiency, particularly in situations where air defense cover may be limited. The following guidelines should be used when setting up supply points:

- The location should be selected where trails already exist. Vehicles must use existing trails to the extent possible.
- Stocks should be irregularly spaced, both in length and depth, to the maximum extent possible so that there is no definite pattern.
- Stocks should be piled as 1ow as possible and preferably dug-in. For example, a stack of gasoline cans should be only one can high.
- The shape of the area should not be square or rectangular, but should follow the local ground pattern.
- Stocks should be covered with sand, gravel, burlap, netting, or anything else that harmonizes with the local terrain, and the sides should be gradually sloped with soil filled to the top of the dump.
- The contents of each supply point should be mixed so that the destruction of one supply point will not cause an immediate shortage of a particular commodity.